



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| | | | | |
|--------------------------------|-------------|----------------------|---------------------|------------------|
| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/590,455 | 08/24/2006 | Takeo Tanaami | Q96638 | 8513 |
| 23373 | 7590 | 01/12/2009 | EXAMINER | |
| SUGHRIUE MION, PLLC | | | FORMAN, BETTY J | |
| 2100 PENNSYLVANIA AVENUE, N.W. | | | | |
| SUITE 800 | | | ART UNIT | PAPER NUMBER |
| WASHINGTON, DC 20037 | | | 1634 | |
| | | | MAIL DATE | DELIVERY MODE |
| | | | 01/12/2009 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|--------------------------------------|---------------------------------------|
| Office Action Summary | Application No. 10/590,455 | Applicant(s) TANAAMI ET AL. |
| | Examiner BJ Forman | Art Unit 1634 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-11 is/are pending in the application.
 - 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 1-11 is/are rejected.
- 7) Claim(s) ____ is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 24 August 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 0/06, 12/06 5/08.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 27 May 2008 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered as noted on the 1449.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 3-11 are indefinite in the last line of Claim 1 for the recitation "its proximity part" because the recitation lacks proper antecedent basis in the claim. It is suggested that the claim be amended to clarify the probe immobilization.

Claim 2 is indefinite for the recitations "its proximity part" because the recitation lacks proper antecedent basis in the claim. It is suggested that the claim be amended to clarify the probe immobilization.

Claims 10 and 11 are indefinite in Claim 10 because the claim is drawn to a method of hybridization but the method steps as recited in the claim do not perform hybridization. Therefore, it is unclear whether the intended purpose of hybridization is obtained.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Holzel et al (Biosensor and Bioelectronics, 2003 18: 555-564).

Regarding Claims 1 and 2, Holzel et al disclose a microarray substrate comprising a pair of conduction paths (i.e. 2 neighboring electrodes) connected to alternating current source wherein the electrodes are arranged in proximity to each other such that an electric field is locally stronger and wherein probes are immobilized on the electrodes (Fig. 1-2, Abstract, § 2.2, § 2.3, § 3.1). The electrode-immobilized probes are encompassed by the immobilization “on the conduction paths” because the electrodes are conductive and. Additionally, the electrode-immobilized probes are encompassed by the immobilization “close to its proximity part” because the probes are immobilized in the region where the neighboring electrodes are in proximity to one another (Fig. 2).

Regarding Claim 3, Holzel et al disclose the microarray having two or more proximity parts i.e. multiple gaps formed by interdigitated electrodes (Fig. 2 & 4).

Regarding Claim 4, Holzel et al disclose the microarray wherein the substrate is glass (§ 2.1.1) and the conductive paths are formed by printing (§ 2.2.1). While the reference teaches formation of the electrodes as claimed, the method of making the electrodes does not define the microarray over other methods of making the same microarray.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) see MPEP 2113.

Regarding Claim 7, Holzel et al disclose the device of Claim 1 further comprising a power source for supply AC voltage (page 560, left column, first full paragraph).

Regarding Claim 8, Holzel et al disclose the device of Claim 7 further comprising a glass/transparent cover opposite the substrate (§ 2.2.4 and Fig. 3).

Regarding Claim 9, Holzel et al disclose the device wherein the electrodes are formed on glass (i.e. transparent material) and further teaches fluorescent detection (§ 2.1.1 and § 2.2.4).

Regarding Claim 10, Holzel et al disclose a method of performing hybridization comprising applying AC voltage to the conductive paths in the device of Claim 7 whereby the biopolymer is concentrated via dielectrophoresis (§ 3.1).

Regarding Claim 11, Holzel et al disclose the method wherein the biopolymer is detected by fluorescent signal following hybridization (Fig. 6).

6. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Zenhausern et al (U.S. Patent Application Publication No. 2004/0011650, published 22 January 2004).

Regarding Claims 1 and 2, Zenhausern et al disclose a microarray substrate comprising a pair of conduction paths (i.e. interdigitated electrodes) connected to direct current and alternating current source (¶ 272) wherein the electrodes are arranged in proximity to each other such that an electric field is locally stronger (¶ 272) and wherein probes are immobilized on the electrodes (i.e. capture probes, ¶ 14, ¶ 24, ¶ 272 and Fig. 3-4). The electrode-immobilized probes are encompassed by the immobilization "on the conduction paths" because the electrodes are conductive and. Additionally, the electrode-immobilized probes are encompassed by the immobilization "close to its proximity part" because the probe are immobilized in the region where the neighboring electrodes are in proximity to one another (Fig. 3-4).

Regarding Claim 3, Zenhausern et al disclose the microarray having two or more proximity parts i.e. multiple gaps formed by interdigitated electrodes and multiple sets of interdigitated electrodes (Fig. 3 & 4).

Regarding Claim 4, Zenhausern et al disclose the microarray wherein the substrate is glass, ceramic or plastic (¶ 44) and the conductive paths are formed by printing (¶ 55). While the reference teaches formation of the electrodes as claimed, the method of making the electrodes does not define the microarray over other methods of making the same microarray (see MPEP 2113).

Regarding Claim 5, Zenhausern et al disclose the device wherein the paths are insulated i.e. monolayer thus serves as a physical barrier to block solvent accessibility to the detection electrode(¶ 221).

Regarding Claim 6, Zenhausern et al disclose the device further comprising an electrode, separate from the immobilization electrode, for detecting hybridization (¶ 247-250).

Regarding Claim 7, Zenhausern et al disclose the device of Claim 1 further comprising a power source for supplying DC and AC voltage (¶ 57-58, ¶ 272).

Regarding Claim 10, Zenhausern et al disclose a method of performing hybridization comprising applying AC voltage to the conductive paths in the device of Claim 7 whereby the biopolymer is concentrated via dielectrophoresis (¶ 205-207).

Regarding Claim 11, Zenhausern et al disclose the method wherein the biopolymer is detected by fluorescent signal following hybridization (¶ 212-213).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zenhausern et al (U.S. Patent Application Publication No. 2004/0011650, published 22 January 2004) in view of Holzel et al (Biosensor and Bioelectronics, 2003 18: 555-564).

Regarding Claims 8-9, Zenhausern et al disclose a microarray substrate comprising a pair of conduction paths (i.e. interdigitated electrodes) connected to direct current and alternating current source (¶ 272) wherein the electrodes are arranged in proximity to each other such that an electric field is locally stronger (¶ 272) and wherein probes are immobilized on the electrodes (i.e. capture probes, ¶ 14, ¶ 24, ¶ 272 and Fig. 3-4).

Zenhausern et al further teach the substrate is glass (¶ 44) and wherein the biopolymer is detected by fluorescent signal following hybridization (¶ 212-213) but the reference is silent regarding a transparent cover whereby fluorescence can be viewed for back or top. However, Holzel teach a similar device comprising a glass/transparent cover opposite the substrate (§ 2.2.4 and Fig. 3) wherein the electrodes are formed on glass (i.e. transparent material) and further teaches fluorescent detection

(§ 2.1.1 and § 2.2.4). Holzel et al further teach the arrangement provides ease of handling and electrical connection (page 560, lines 7-10).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the glass cover of Holzel to the device of Zenhausern. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the benefit of providing ease of handling and electrical connection as taught by Holzel (page 560, lines 7-10).

Conclusion

9. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BJ Forman
Primary Examiner
Art Unit 1634

/BJ Forman/
Primary Examiner, Art Unit 1634